

AMENDMENTS TO THE SPECIFICATION

Please replace the Abstract with the following:

ABSTRACT OF THE DISCLOSURE

A pulsed dc reactive magnetron sputter deposition apparatus and process enables large substrates to be coated with one ~~ore~~ or more sputter cathodes having a size smaller than the substrate. The reactive sputtering is provided over a long throw distance between the sputter cathode and the substrate, and approximating a long mean free path. The substrate to be coated due to the low pressures enabled by the use of pulsed DC magnetrons. The low pressures, e.g. less than 1 mTorr, allows for a long throw distance which approximates the long the mean free path. And a pulsed dc power source provides sufficient energies to emit sputtered target particles across the long throw distance to the substrate substantially without collision, to produce optical coating with optics grade qualities.

Please replace paragraph [0022] with the following:

[0022] Figure 2 shows a second embodiment of the present invention generally indicated at reference character 20, and having multiple magnetrons (two shown: 22, 23) positioned within a vacuum chamber 21. And similar to Figure 1, Figure 2 shows a relative large substrate 35 mounted to a substrate holder assembly 34, such that sputtered target particles 33 are sputtered thereon. It is appreciated that the target source utilized for each of the magnetrons 22, 23 may be the same or different

material types commonly known and used in the relevant art for sputter deposition. Additionally, when multiple magnetrons are utilized to produce the reactive sputtering, the long throw distance may be chosen as a function of the width area of the substrate to be coated. Moreover, the long throw distance may be determined as a function of the number of magnetrons utilized, for optimizing deposition. And similar to Figure 1, the vacuum chamber 21 is also provided with a means for evacuating the vacuum chamber (not shown) to reach low-pressure levels less than 1 mTorr, and of a type known in the mechanical arts. A dc power supply 24 is provided and connected to each of magnetrons 22, 23 to provide power thereto. Pulse controllers 24 26 and 25 are provided which may operate independently for example to pulse the dc waveform to the magnetrons 22 and 23, respectively. Each of the magnetrons 22, 23 generally operate as described above to bombard the target surface with a suitable sputtering gas atom or ion, supplied directly to the target source.